High School South AP Chemistry Summer Assignment
Complete and show work on a separate piece of paper.

1. An 8.47g sample of a solid is placed in a 25.00mL flask. The remaining volume in the flask is filled with benzene, in which the solid is insoluble. The solid and benzene together weigh 24.54g. The density of the benzene is 0.879g/mL. What is the density of the solid?

2. Fill in the following table using your knowledge of atomic structure

A   charge

$$X$$

Z

A = mass #
Z = atomic #

Symbol	Atomic Number	Mass Number	# of Protons	# of Neutrons	# of Electrons
13 C 6					
28 Si 14					
35 Cl $^{-1}$ 17					
24 Mg $^{+2}$ 12					

3. Write the correct name for each of the following compounds:

a. Ag_2CrO_4 b. $Pb(OH)_2$ c. H_2SO_4 d. KOH e. HNO_2 f. $HC_2H_3O_2$ g. BF_3	h. FeI_3 i. NH_4NO_3 j. HF k. NH_3 l. Na_2CO_3 m. Cu_2O	n. $Zn(NO_2)_2$ o. N_2O_5 p. $CdCr_2O_7$ q. $HClO_4$

4. Write the correct formula for each of the following compounds:

a. zinc phosphate b. iron (II) sulfate c. sodium oxide d. hydroiodic acid e. potassium permanganate f. nitric acid g. barium hydroxide	h. silver chloride i. ammonium sulfide j. hydrosulfuric acid k. iodine pentachloride l. tetraphosphorus hexoxide m. phosphoric acid	n. tin (IV) acetate o. aluminum sulfite p. methane q. sulfurous acid

5. Write balanced molecular equations and balanced net ionic equations for the following.

    a. $CuCl_{2(aq)} + Na_2S_{(aq)} \rightarrow$
    b. $NiSO_{4(aq)} + KOH_{(aq)} \rightarrow$
    c. $Hg_2(NO_3)_{2(aq)} + CaCl_{2(aq)} \rightarrow$
    d. $Cl_{2(g)} + NaI_{(aq)} \rightarrow$
    e. $C_2H_{4(g)} + O_{2(g)} \rightarrow$

6. Identify the oxidation number of the sulfur in the following molecules and ions:

    a. H_2S
    b. SO_3^{2-}
    c. H_2SO_4

7. How many glucose molecules ($C_6H_{12}O_6$) are in 5.23 grams?

8. Phosphorus has a molecular formula of P_4 and sulfur has a molecular formula of S_8. How many grams of phosphorus contain the same number of molecules as 6.41g of sulfur?

9. Calculate the mass percentage of oxygen in Mn_2O_3

10. Calculate the empirical formula for a solid which contains 2.08 g aluminum and 1.85 g oxygen.

11. Calculate the empirical formula for a salt which is 17.7% Mg, 10.2% N, 2.9% H, 22.5% P and 46.7% O

12. A compound contains only carbon, hydrogen, and oxygen. Combustion of 10.68mg. of the compound yields 16.01mg of CO_2 and 4.37mg of H_2O. The molar mass of the compound is 176.1g/mol. What are the empirical and

molecular formulas of the compound?

13. Potassium permanganate reacts with sulfuric acid to produce potassium sulfate, manganese (VII) oxide and water. How many grams of Mn_2O_7 can be formed from 196 g of $KMnO_4$?

14. Lithium nitride is prepared by reacting lithium metal and nitrogen gas. Calculate the mass of lithium nitride formed from 56.0 g of nitrogen gas and 56.0 g of lithium.

15. How would you prepare 50.0ml of 0.25M solution of $NaCl_{(aq)}$?

16. An unknown sample of mystery element T is analyzed. According to the data 7.42% of the element is ^6T and 92.58% is ^7T. The true mass of ^6T is 6.02amu and 7.02amu for ^7T. Calculate the average atomic mass and identify the element.